

SEA TURTLE FUN FACTS ●

SEA TURTLE Q&A ●

WHY SEA TURTLES MATTER ●

THE THREATS SEA TURTLES FACE ●

HOW WWF IS HELPING SEA TURTLES ●

WHAT KIDS CAN DO ●

TEACHING TOOLS ABOUT

SEA



TURTLES



WILD CLASSROOM

EDUCATOR'S RESOURCE GUIDE



WILD CLASSROOM

WWF's Wild Classroom connects educators and parents with the tools and resources they need to help kids explore and understand the world around them. Visit wildclassroom.org to choose from a growing library of animal- and nature-related teacher's guides, fact sheets, and activity plans that you can use to enhance your science, writing, art, and other lessons.

Together we can inspire the next generation to build a future where people and nature thrive!

SEA TURTLES

● Sea Turtle Fun Facts

- Sea turtles are reptiles that have existed on Earth for over 100 million years. This means their ancestors were around at the time of the dinosaurs!
- Sea turtles cannot breathe underwater and need to come to the surface for air. They can hold their breath underwater for as long as 4–7 hours if they are resting or sleeping.
- Sea turtles are the only reptile to travel extensively. Some migrate thousands of miles across entire oceans between feeding and nesting grounds.
- Male sea turtles typically never leave the ocean. Females come ashore to lay their eggs—usually on the exact same beaches where they were born!
- During sea turtle nesting season, a female can lay up to 180 eggs at a time, as often as six times!
- While sea turtles mostly live in shallow waters, they are known to dive to deeper depths in search of food, cooler temperatures, or protection from predators. Leatherback sea turtles can dive 4,035 feet deep—almost a mile!
- Depending on the species, a sea turtle's diet can consist of seagrasses, jellyfish, sponges, sea urchins, sea anemones, mollusks, or crabs and other crustaceans.
- Green sea turtles are named for the greenish color of their cartilage and fat—not their shells! On the other hand, the olive ridley turtle is named for the olive color of its shell.
- Loggerhead turtles carry colonies of small plants and animals on their shells. As many as 100 species of animals and plants have been recorded living on a single loggerhead.
- Hawksbill sea turtles are named for their narrow, pointed beaks, which they use to eat sponges and sea anemones from coral reefs.
- Sea turtles typically live up to 50 years or more. Most marine turtles take decades to mature to adulthood—between 20 and 30 years.



● Sea Turtle Q&A

What is a sea turtle's extinction risk?

Different species of sea turtles have varying extinction risks: leatherback, olive ridley, and loggerhead sea turtles are listed as vulnerable; green sea turtles are endangered; hawksbill and Kemp's ridley sea turtles are critically endangered; and flatback sea turtles are data deficient (meaning there is not enough information to determine their conservation status).

How many sea turtles are in the wild?

Because males never return to shore, it is difficult to keep track of population numbers of sea turtle species. Some researchers are using satellite tags to more accurately monitor sea turtle populations and their swim patterns.

Where do sea turtles live?

Sea turtles can be found in most of the world's oceans, apart from the cold polar seas. They spend their lives mainly in the shallow, sunlit waters around continental shelves (underwater land masses that extend out from the world's continents).

What is a sea turtle's weight?

The two smallest species of sea turtle, the Kemp's ridley and the olive ridley, can weigh as little as 75 pounds. The largest, the leatherback, can weigh up to 1,500 pounds.

How big is a sea turtle?

2-6 feet long

How many species of sea turtles are there?

There are seven species of sea turtles: green, hawksbill, loggerhead, leatherback, olive ridley, Kemp's ridley, and flatback.

How do sea turtles raise their young?

To lay their eggs, female sea turtles return to the same beaches where they were born. Once she completes the nest and lays her eggs, the female sea turtle returns to the ocean. The hatchlings are left to fend for themselves and must locate and make their way to the water on their own.



● Why Sea Turtles Matter

They are a fundamental link in marine ecosystems.

Humans rely on oceans for important natural resources and for their livelihoods. Oceans supply fish and other seafood that feeds billions of people. They also provide seaweed and marine plants used to manufacture products, chemicals, energy, and construction materials. Sea turtles, as key players in the marine ecosystem, help maintain the health and population of the fish and plant resources that people need. Green turtles graze on seagrasses and algae, which maintains seagrass beds and makes them more productive (much like mowing the lawn to keep it healthy). Seagrass beds function as nurseries for fish, shrimp, lobsters, and other sea life. Leatherback turtles consume large numbers of jellyfish, which helps keep their populations in check.

They provide a vital source of income for coastal communities.

Sea turtles have become increasingly important as tourist attractions, providing employment for people living in communities surrounding many ocean ecosystems. These sustainable livelihoods help ensure that local people no longer need to rely on turtle products for income.

They are culturally significant in communities around the world.

Being one of the longest-enduring animals on earth, sea turtles have been considered symbols of wisdom, strength, and longevity in many cultures. For example, according to Hindu mythology, the India deity Vishnu was reincarnated as “Kachhapa,” a turtle that holds the burden of the world on its back. The Hawaiian word “honu,” or green sea turtle, represents good luck and long life.





● The Threats Sea Turtles Face

Sea turtles journey between land and sea and swim thousands of ocean miles during their long lifetimes, exposing them to countless threats—both natural and those caused by humans. As a result, as few as one in 1,000 sea turtles will survive to adulthood.

Irresponsible fishing practices

Hundreds of thousands of sea turtles are accidentally caught by fishing gear every year. They often get trapped in fishing nets, snagged on longline fishing hooks, and tangled in lines and discarded fishing gear. Once they're caught, it is difficult for sea turtles to reach the surface to breathe, and many drown.

Illegal trade and consumption

Tens of thousands of sea turtles and their eggs are lost every year because they are illegally or irresponsibly harvested for food and income. Turtle shells are traded and used to make products and souvenirs for sale. Some people also use turtles for medicine or for religious ceremonies.

Habitat loss

Uncontrolled coastal development, vehicle traffic on beaches, and other human activities have destroyed or disturbed turtle nesting beaches around the world. Turtle feeding grounds, such as coral reefs and seagrass beds, are damaged by activities onshore, including the clearing of land and agriculture, which can cause harmful waste to enter the water.

Pollution

Trash in the world's oceans comes from many sources, including garbage that washes off streets and waste from landfills that blows into streams leading into the ocean. We produce so much trash that within the next decade, there could be a pound of plastic for every three pounds of fish in the ocean. Once in the ocean, this debris can travel the currents for years, accumulating in large patches and washing up on beaches.

Climate change

Warmer oceans are driving stronger storms and bleaching coral reefs, which are important feeding grounds for sea turtles. Rising sea levels can destroy critical nesting beaches and damage sea turtle nests. Climate change also impacts the gender of sea turtles: Warmer nests produce female hatchlings, and cooler nests produce males. Rising temperatures due to the effects of climate change could result in fewer males, which would upset the gender balance that is critical for reproduction.



● How WWF Is Helping Sea Turtles and the Oceans Where They Live

Environmental organizations like WWF are dedicated to protecting sea turtles and increasing their population numbers, as well as safeguarding the places where they nest and live.

Promoting sustainable fishing and reducing bycatch

WWF is working to double the number of responsible fisheries around the world by carefully tracing seafood entering the US and monitoring fishing practices to prevent overfishing and illegal fishing. We are also helping reduce accidental capture (bycatch) of sea turtles by encouraging fisheries to switch to more turtle-friendly nets (for example, ones equipped with lights and escape hatches) and to use special fishing hooks that are more difficult for turtles to swallow.

Protecting marine habitats

Wetlands, seagrass beds, mangroves, and coral reefs protect our coastlines from weathering and erosion, and provide essential protection and feeding grounds for many marine animals, including sea turtles. WWF works around the world to establish Marine Protected Areas, ensuring sea turtles and other marine life have a safe place to nest, feed, and migrate freely. We support local turtle conservationists in many parts of the world to monitor and protect turtle nests, as well as to help establish eco-friendly tourism opportunities.

Minimizing climate change impacts

Our oceans absorb most of the environmental warming and carbon pollution occurring today—even more than the atmosphere. WWF studies how sea turtles are being affected by climate change and helps determine the best ways to reduce their vulnerability to changing environmental conditions. We work with communities around the world to monitor and protect nesting beaches, helping turtles become more resilient to the future impacts of climate change.

Addressing overharvesting and illegal trade

Despite an international ban on trade in all sea turtle species, illegal trafficking in turtle parts continues. WWF works through TRAFFIC, the wildlife trade monitoring network, to stop the illegal trade of turtle meat, eggs, and shells. We train and equip local rangers to patrol turtle nesting beaches and protect against poaching. We also work with local communities to reduce turtle harvesting and egg collection. Because trade in turtles is often driven by a lack of economic choices, we help develop alternative livelihoods, like ecotourism, so that local people are no longer dependent on turtle products for income.



● What Kids Can Do

WWF works to protect sea turtles all around the world, but kids can help protect them right at home! Here are some things kids can do to help save sea turtles and other animals.

Watch your trash

Be aware of how you are disposing your trash. Don't throw litter anywhere except proper waste containers. When finished using a plastic product, you should always attempt to either recycle it or dispose of it properly. Bring reusable shopping bags when you go to the store to cut down on the number of plastic bags. Litter on the ground or beach is likely to get washed into the water or picked up by the wind and become marine debris, which sea turtles can get mangled in or mistake for food.

Purchase sustainable seafood



Next time you go grocery shopping with your family, make sure to buy seafood with the MSC (Marine Stewardship Council) logo on it, certifying that it was produced using responsible fishing methods that minimize accidental catch.

Be aware of the illegal wildlife trade

Poaching and the illegal wildlife trade are major threats to the future of sea turtles and other endangered wildlife across the world. Never buy any products or souvenirs that come from endangered animals like sea turtles, including shells, skins, eggs, jewelry, and hairbrushes or combs. Wildlife trade has the potential to be very damaging to species' survival and their delicate ecosystems.

Spread the word

Kids can talk to their parents and friends about what they have learned about sea turtles and ask them to do the things on this list, too!

Start a fundraiser to help sea turtles and nature

By creating a fundraiser with WWF's Panda Nation, you're empowering your students to protect the wildlife and wild places they've been studying. It's a great opportunity to teach about the importance of philanthropy and the difference we can make when we work together. Get started at www.pandanation.org.



More Sea Turtle Teaching Tools

Sea turtle fill-in-the blank word puzzle

Teach your students the educational content from the guide with a fun word puzzle.

Sea turtle learning activities

Within the Sea Turtle Toolkit, you'll find six fun, engaging activities designed to help students learn about sea turtles and their habitat:

Turtles on Vacation—Social Studies

Students utilize their research skills to discover more about areas of the world that rely on sea turtles, and then create travel brochures advertising ecotourism opportunities.

Be Careful What You Fish For—Science

Students perform the steps of the scientific method while participating in a fun activity that shows how bycatch affects marine life and challenges them to brainstorm solutions.

The Case of the Missing Sea Turtle—Science

Through sequencing, students become junior investigators tasked with solving a mystery by placing clues of climate change in order.

A Need for the Seas—Language Arts

This persuasive writing exercise allows students to gain a sense of empowerment by composing a letter that addresses the threats sea turtles and oceans face.

Only Jellies in the Belly—Arts Education

After learning about ocean pollution, students will embrace their artistic skills to create a jellyfish out of plastic, so that they can visualize how sea turtles often mistake trash for food.

How Low Can They Go?—Physical Education

This sea turtle-themed twist on a classic game allows students to understand the various depth zones of the ocean and the adaptations marine animals must possess in order to survive there.

Sea turtle poster

Create an inviting learning space with [free downloadable posters](#) of sea turtles (along with fun facts).

WWF Together app

For more fun, interactive tools and information about sea turtles and other wildlife, download the [WWF Together app](#).



SEA TURTLES



Name: _____ Date: _____

SEA TURTLE Fill-in-the-Blank

Complete the puzzle with words related to the sea turtle. Use your sea turtle fact sheet to help you.

- | | |
|---|---------------|
| 1. Sea turtles are ___ that have existed on Earth for over 100 million years. | _____ P _____ |
| 2. Sea turtles can hold their _____ for several hours. | _____ R _____ |
| 3. Sea turtles have been around since the time of the _____. | _____ O _____ |
| 4. Green sea turtles are named for the color of their ___ and fat. | _____ T _____ |
| 5. Sea turtles have been known to ___ deep into the ocean. | _____ E _____ |
| 6. Sea turtles cannot _____ their head and legs. | _____ C _____ |
| 7. Very few sea turtle _____ survive to adulthood. | _____ T _____ |
| 8. There are _____ species of sea turtle. | _____ S _____ |
| 9. ___ sea turtles almost never leave the ocean. | _____ E _____ |
| 10. Females lay their eggs on the ___ beach where they were born. | _____ A _____ |
| 11. ___ from roads and buildings disorients hatchlings. | _____ T _____ |
| 12. The gender of a sea turtle can be affected by _____. | _____ U _____ |
| 13. Sea turtles can _____ for thousands of miles. | _____ R _____ |
| 14. The largest species of sea turtle is the _____. | _____ T _____ |
| 15. You can find sea turtles in most oceans except cold ___ seas. | _____ L _____ |
| 16. A favorite food of sea turtles, it commonly gets mistaken for plastic bags. | _____ E _____ |
| 17. Females come ashore to lay their _____. | _____ S _____ |



SEA TURTLES



SEA TURTLE Fill-in-the-Blank | ANSWER KEY

Complete the puzzle with words related to the sea turtle. Use your sea turtle fact sheet to help you.

1. Sea turtles are ___ that have existed on Earth for over 100 million years.
2. Sea turtles can hold their _____ for several hours.
3. Sea turtles have been around since the time of the _____.
4. Green sea turtles are named for the color of their ___ and fat.
5. Sea turtles have been known to ___ deep into the ocean.
6. Sea turtles cannot _____ their head and legs.
7. Very few sea turtle _____ survive to adulthood.
8. There are _____ species of sea turtle.
9. ___ sea turtles almost never leave the ocean.
10. Females lay their eggs on the ___ beach where they were born.
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12. The gender of a sea turtle can be affected by _____.
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15. You can find sea turtles in most oceans except cold ___ seas.
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R E P T I L E S

B R E A T H

D I N O S A U R S

C A R T I L A G E

D I V E

R E T R A C T

H A T C H L I N G S

S E V E N

M A L E

S A M E

L I G H T

T E M P U R A T U R E

M I G R A T E

L E A T H E R B A C K

P O L A R

J E L L Y F I S H

E G G S



SEA TURTLES

Learning Activity:

The Case of the Missing Sea Turtle

Activity Type	Scientific investigation
Focus Areas	Science, language arts
Time Required	20–30 minutes

● Overview

In this activity, students become junior scientific investigators who try to solve the mystery of the missing sea turtle. You will provide them with clues, and they must use sequencing skills to place the clues in order. The sequence of clues will lead them to solve the mystery while also learning about the effects of climate change.

● Objective

At the completion of the activity, students should be able to:

- Gain familiarity with the process of scientific investigation and sequencing.
- Define climate change and its causes.
- Explain the effects climate change has on oceans and sea turtles.

Next Generation Science Standards

- 3-L-S4-3 Biological Evolution: Unity and Diversity
 - Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
- 4-ESS3-1 Earth and Human Activity
 - Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.



● Subject and Standards

Common Core Standards: English Language Arts

- RI. 3.3: Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.
- RI. 4.4: Describe the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text.

● Materials Needed

Teacher preparation: scissors and climate change clues—printed, separated, and placed into a bag (one bag of clues per student or group of students)

Per student or group of students:

- Writing utensil
- Sequencing sheet (see handouts at the end of this activity)
- Glue stick
- Prepared bag of clues

● Vocabulary

- **Climate change:** Earth's increase in temperature attributed directly or indirectly to human activity that alters the global atmosphere
- **Coral bleaching:** a stress response triggered by high water temperatures that causes coral colors to fade to white and can lead to coral death
- **Fossil fuels:** formed from fossilized remains of prehistoric organisms (most common are coal, oil, and natural gas) and are burned to generate energy; the biggest drivers of climate change
- **Greenhouse gases:** examples are water vapor, carbon dioxide, methane, and nitrous oxide; they absorb some of the sun's heat energy and trap it in the atmosphere, making Earth warmer
- **Habitat:** a natural environment in which plants and animals live, breed, and get their food, water, and shelter



● Activity Procedure

Part 1: Introduction and Preparation

- Before beginning the activity, prepare enough bags of clues to have one set per student or group of students. Print out and cut apart the clues (at the end of this activity), and shuffle a complete set in each bag. Each bag will contain the following clues:
 - Humans add greenhouse gases to the atmosphere by burning fossil fuels and clearing forests.
 - Once in the atmosphere, greenhouse gases act like a blanket and trap heat from the sun.
 - Because the heat is trapped, Earth becomes hotter.
 - When Earth gets hotter, so do the oceans.
 - Certain areas of the ocean, like coral reefs, are very sensitive to this increase in water temperature.
 - Algae that live in coral (and are a source of food for coral) don't like it when the water gets too warm.
 - The algae leave the coral.
 - Without algae for food, coral become bleached and unhealthy, and can die.
 - Marine animals (like sea sponges and sea anemones) that live on coral reefs now don't have a healthy habitat, so they also can become unhealthy or will leave in search of a new habitat.
 - Sea turtles, which come to coral reefs looking for food like sea sponges, find nothing good to eat, so they leave as well.
- Students should have a basic understanding of sequencing prior to the start of this activity. For a quick review, ask them to describe their morning routine, step by step, as if they were creating a detailed to-do list, in order of first to last. Discuss with the students the fact that many scientists use sequences when doing their research. Scientists gather evidence, just like detectives, and use it in determining a sequence of events to explain something in nature.
- Using the "Threats Sea Turtles Face" section of the [Sea Turtle Educator's Resource Guide](#), along with the vocabulary definitions provided on page 2, discuss with the students the causes of climate change and its effects on sea turtles and their ocean habitats.
 - Climate change has been linked not only to causing an increase in ocean temperature (which leads to the weakening of corals and other marine habitats), but also to causing rises in sea level and in ocean acidity, which threaten many marine food supplies.



Part 2: Activity

- Distribute one bag of clues per student or group of students. Each student or group should also have a copy of the sequencing sheet handout (included at the end of this activity), a writing utensil, and a glue stick.
- Explain to the students that they are going to become scientists investigating a mystery and drawing a conclusion by placing clues in sequential order. Here's the situation they are investigating: The class goes to visit a coral reef where a sea turtle friend likes to spend time looking for food. However, when they get there, he is nowhere to be found. In fact, hardly any marine animals are there. The coral reef that was once healthy and full of life is now abandoned. As scientists, the students' job is to discover what made the marine life leave the coral reef.
- Students will then have to empty their bag of clues on their desks and attempt to place them in sequential order to solve the mystery of the missing sea turtle.
- Once they feel confident in the order of clues, students should glue the strips of paper in sequence on their lab sheets. Remind them to glue the steps only when they are sure of the right sequential order.

Part 3: Discussion and Assessment

- Encourage students to explain, in their own words, what caused the animals to leave the reef. They should come to conclusions related to climate change and how the rising sea temperatures affect the health of the coral reef habitat and its inhabitants, including sea turtles.
 - If opinions vary, encourage students to explain how they came to their conclusions. Ask students to discuss how they shared their knowledge and collaborated during the investigation to arrive at the order of their clues.





Extended Learning Options

- An optional approach to this activity is to present the task of solving the mystery as a competitive race among teams of students to see which team can arrange the steps in order first. You might also choose to solve the case as a class by printing large versions of the clues and selecting students to arrange them on the board.
- Provide a follow-up assignment that challenges students to research other ways climate change affects and threatens sea turtles.
 - For example, the gender of sea turtles can be affected by the temperature surrounding their nest. Warmer nests produce female hatchlings, and cooler nests produce males. Rising temperatures due to the effects of climate change could result in fewer males, which would upset the gender balance for reproduction. How would having more females than males put the future of sea turtles at risk?
- Start a class fundraiser to protect sea turtles and other wildlife and their habitats, using WWF's online fundraising tool, Panda Nation. Learn more at pandanation.org.
- Download the [WWF Together app](#) and explore the sea turtle segment. Use these interactive tools to help kids learn more about sea turtles and the threats they face.



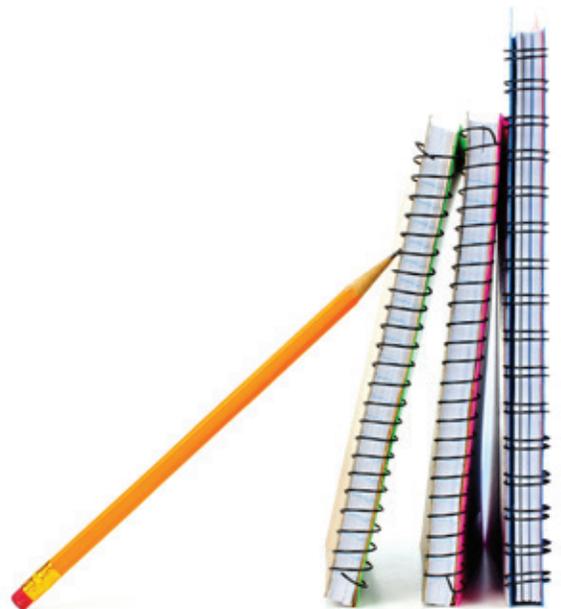


● Additional Background Info

You can use the information found at the links below to enhance your discussion with the class, or you may want to share some links directly with students if you determine they are grade-level appropriate.

- **Video:** [Saving Coral Reefs One Fragment at a Time](#)—reviews how climate change is affecting coral reefs and how scientists are working to sustain a future for corals
- **Video:** [Adaptation of a Turtle Beach to Climate Change](#)—shows the measures a Costa Rican beach community is taking to prepare for and adapt to climate change
- **Article:** [What We Learned About Coral Reefs in 2019](#)—summarizes recent findings on the state of coral reefs and the communities that rely on them
- **Article:** [Everything You Need to Know About Coral Bleaching — And How We Can Stop It](#)—summarizes the impacts of coral bleaching and how to help
- **Video:** [A Turtle's Eye View of the Great Barrier Reef](#)—shows scenes from the Great Barrier Reef from the perspective of a sea turtle
- **Video:** [Why Are Coral Reefs Turning White?](#)—animation that explains coral bleaching

For more fun classroom activities with a focus on wild species and conservation, visit wildclassroom.org.





SEA TURTLES

Name: _____ Date: _____

● Climate Change Sequencing

Your class goes to visit a sea turtle friend where he likes to spend time near the coral reef. However, when you get there, the coral reef that was once thriving is now abandoned. Why did everybody leave the coral reef? Put your clues in sequential order to solve the mystery!

1)

2)

3)

4)

5)

6)

7)

8)

9)

10)



● Climate Change Sequencing Clues

Humans add greenhouse gases to the atmosphere by burning fossil fuels and clearing forests.

Once in the atmosphere, greenhouse gases act like a blanket and trap heat from the sun.

Because the heat is trapped, Earth becomes hotter.

When Earth gets hotter, so do the oceans.

Certain areas of the ocean, like coral reefs, are very sensitive to this increase in water temperature.

Algae that live in coral (and are a source of food for coral) don't like it when the water gets too warm.

The algae leave the corals.

Without algae for food, coral become bleached and unhealthy, and can die.

Marine animals (like sea sponges and sea anemones) that live on coral reefs now don't have a healthy habitat, so they also can become unhealthy or will leave in search of a new habitat.

Sea turtles, which come to coral reefs looking for food like sea sponges, find nothing good to eat, so they leave as well.



Learning Activity:

Be Careful What You Fish For

Activity Type	Engineering/design challenge
Focus Areas	STEM
Time Required	60–75 minutes

● Overview

Students will learn the steps of the scientific method as they perform an experiment to understand one of the greatest threats that sea turtles face: accidental capture in fishing gear (known as bycatch). Using common materials to model existing fishing methods, students will “go fishing” and reflect on their results. Relating this to real-life challenges, students will then propose engineering design solutions to minimize the impacts that fishing has on sea turtles.

● Objective

At the completion of the activity, students should be able to:

- Identify the steps of the scientific method.
- Define “bycatch”, and describe the threat it poses to sea turtles and other marine life.
- Use engineering skills to predict and propose effective design strategies to prevent accidental capture of sea turtles.

● Subject and Standards

Next Generation Science Standards:

- 2-PS1-2 Matter and Its Interactions
 - Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.
- 3-5-ETS1-1 Engineering Design
 - Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.



- 3-5-ETS1-2 Engineering Design
 - Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- 3-5-ETS1-3 Engineering Design
 - Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

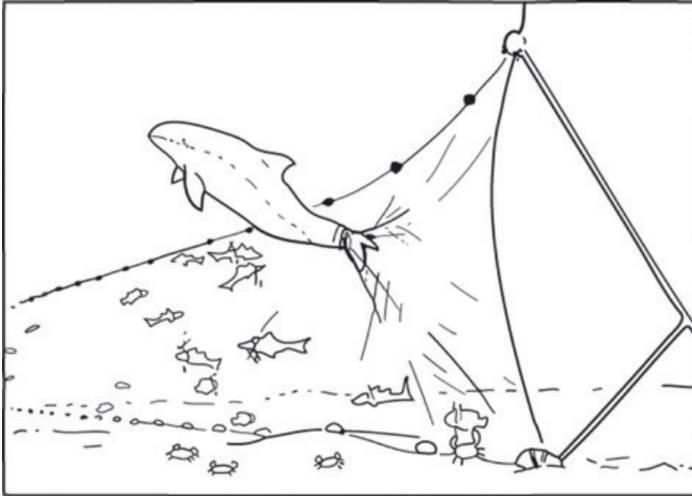
● Materials Needed

- [Sea Turtle Educator's Resource Guide](#) (for background reading)
- **Per student:** paper, pencil, Lab Report Worksheet (see handouts at the end of this activity)
- **Per student or group** (if working in groups, recommended group size is three students):
 - A variety of medium-sized, differently colored items to represent different marine species
 - Suggestions of items to use are beads, buttons, Legos, bingo chips, or a variety of colorful candy (just make sure kids don't eat the lab supplies!). The key idea is to make sure the collection contains multiple items of varying colors.
 - Try to include at least four or five different colors in the mix, with at least five and as many as 15 items of each color. These amounts can be modified to reflect the resources you have available. Having a larger number of items will better demonstrate results, although the activity can be carried out with fewer.
 - A container (preferably a large, rectangular-shaped box or bin) to hold the colored pieces
 - Items that will represent three commercial fishing methods:
 - 1 hair net (honeycomb style) to represent gillnetting
 - 1 sandwich bag, cone-shaped paper cup, or coffee filter to represent trawling
 - 1 roll of heavy duct tape or packing tape to represent longline fishing



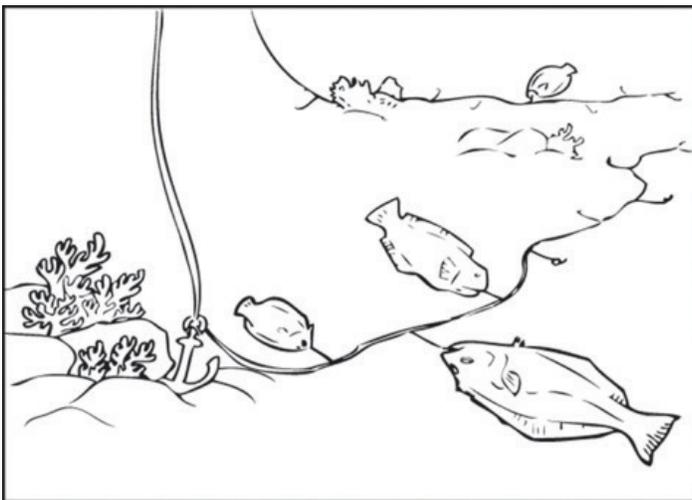
Vocabulary

- **Bycatch:** the accidental capture of species such as dolphins, marine turtles, and seabirds when fishing for or capturing other types of marine species
- **Gillnetting:** the use of mesh nets that allow fish to pass their heads and gills through a hole in the mesh and then get stuck when they try to back out; gillnets can be several miles long and up to 100 feet deep



Drawing: © Peter Diamond/WWF-Canada

- **Longline fishing:** when hundreds of thousands of baited hooks are hung at intervals along a single fishing line

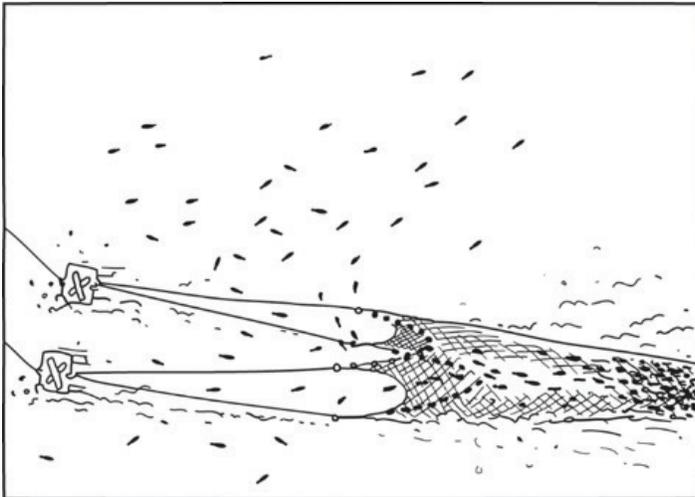


Drawing: © Peter Diamond/WWF-Canada



SEA TURTLES

- **MSC logo:** a symbol from the Marine Stewardship Council placed on seafood that indicates that the fish can be traced back to a sustainable source
- **Sustainable:** of, relating to, or being a method of harvesting or using a natural resource so that the resource is not depleted or permanently damaged; an effective and innovative way to efficiently use natural resources and ensure their continued supply
- **Trawling:** when boats drag large nets along the seabed, catching almost everything in their path



Drawing © Peter Diamond/WWF-Canada



● Activity Procedure

Part 1: Introduction and Preparation

- Prepare each bin with colored materials prior to the activity. Make sure to note how many pieces of each color you place into each bin. There should be an equal number of each color to prevent unbalanced results.
- Ask students what they know about the way fishers try to catch marine animals. Many students will automatically think of a fishing pole, but there are other commercial methods designed to capture a large number of marine animals at one time.
- Using the definitions and the illustrations provided in the Vocabulary section of this activity, review the commercial fishing practices of gillnetting, longline fishing, and trawling with students so they understand how these practices operate.
- Review with students the kinds of seafood that people like to eat and that commercial fishers are trying to catch (for example, tuna and shrimp), as well as the types of marine species that they are catching accidentally (for example, dolphins, sea turtles, and seabirds).
- Now that students have a visual description and understanding of the three methods, have them consider how each one is designed and predict what potential problems might arise, particularly related to the accidental catch of sea turtles and other marine species.
 - Unfortunately, many marine species that aren't intended to be caught will get trapped in fishing nets or on hooks. Once caught in nets, sea turtles and other species will be unable to reach the surface to breathe and could drown. Others won't survive being hooked on fishing lines and pulled out of the water.



Part 2: Activity

Students will now engage in an experiment that mimics these fishing challenges. At completion, they will be able to define the bycatch problems related to these commercial fishing processes and propose possible solutions.

- Ensure that each student has something to write with and a copy of the Lab Report and Data Table Worksheets (provided in the handouts section).
- Review each section of the Lab Report Worksheet with students so that they understand the objectives. Students will follow the steps of the scientific method to observe, collect results, and reflect on the causes and effects of bycatch. Students should complete the Question, Hypothesis, and Materials portions of their lab sheets prior to beginning the experiment. If students are not familiar with the scientific method of experimentation, provide a brief overview.
 - Steps of the scientific method:
 - Define a question or purpose
 - Generate a hypothesis (a predicted answer to the question)
 - Gather materials
 - Follow experimental procedure to gather data
 - Analyze collected information and draw conclusions
- Select a color of item to represent the species for which you want to fish. The rest of the colors will be species to avoid. Choose one color to represent sea turtles. It may be helpful to provide a guide on the board or on paper, identifying each color as representing a certain species. For example:
 - Blue = the species you are trying to catch (for example, shrimp or tuna)
 - Red = dolphins
 - Green = sea turtles
 - Yellow = sharks
 - Purple = stingrays
- Distribute the materials, and make sure to have students count and record the amount of each color and species prior to using the various tools.
- If students are working in groups, each should assign a fishing tool to a specific person in the group. If working individually, the student can try all three fishing methods.



- One at a time, each student will use the assigned tool to try the corresponding fishing method. The goal is to pull up as many of the targeted species and as few of the non-targeted species as possible.
 - To represent trawling, the student will grasp the bag or coffee filter on opposite edges and drag it across the bottom of the bin.
 - To represent longline fishing, the student will rip off one large piece of tape and stick it to the items, pulling up what they can.
 - To represent gillnetting, the student will attempt to pick up their catch with the hairnet.
- After each person pulls up the “catch,” students should record in the Data Table Worksheet the name of the student, the tool that was used, and how many of each color were caught (intentionally and unintentionally) in the Trial 1 box. Take particular note of the number of sea turtles accidentally caught.
- Once totals are recorded, students should mix the items back into the bin in preparation for the next person and repeat the process of recording data.
- At your discretion, depending on time and/or group size, multiple trials can be performed, rotating which students are responsible for each fishing tool. For accuracy, when carrying out an experiment, it is recommended to do a minimum of three trials. If multiple trials are performed, be sure to record the results of each in the Data Table Worksheet.
- Have students complete the Conclusions Worksheet, where they will consider their data and why group members may have gotten different results. As with any experiment, the scientists involved should look for any slight differences that could account for varying data. For example, in this experiment, students using the same tool could have gotten different results depending on how the colors were spread out in their bins or how they used their tools.
- Students should also brainstorm and record potential improvements in net or fishing hook designs that could prevent bycatch.





Part 3: Discussion and Assessment

- Recap the activity by comparing the groups' results. Was one method more successful than the others? Have students discuss the challenges they faced throughout the activity.
- Share with the class what WWF is doing to help prevent and reduce instances of bycatch (links to webpages with information on these are provided in the Additional Background Info section below):
 - **Circle hooks:** WWF is promoting circle hooks to be used for fishing. As opposed to other fishing hooks (like J hooks), if a sea turtle is accidentally caught by a circle hook, it is not as life-threatening and will not affect a fisher's catch.
 - **Turtle Exclusion Devices or TEDs:** Turtle Exclusion Devices were developed for trawlers to allow shrimp to enter the net but provide a way for turtles to escape. This design continues to improve, and WWF is working to promote its use throughout fishing communities.
- Encourage students to share any engineering ideas they have for how they would design a fishing method that would be more effective at reducing bycatch.
- Review ways that students can help. For example, next time you go grocery shopping with your family, make sure to buy seafood with the MSC (Marine Stewardship Council) logo on it, certifying it as being produced using responsible fishing methods that minimize accidental catch.



Extended Learning Options

- To incorporate a more advanced math component, have students calculate success rates as percentages or fractions as part of their Data Table Worksheet.
- Download the [WWF Together app](#) and explore the sea turtle segment. Use these interactive tools to help kids learn more about sea turtles and the threats they face.
- Start a class fundraiser to protect sea turtles and other wildlife and their habitats, using WWF's online fundraising tool, Panda Nation. Learn more at www.pandanation.org.



● Additional Background Info

You can use the information found at the links below to enhance your discussion with the class, or you may want to share some links directly with students if you determine they are grade-level appropriate.

- **Video:** [Reducing Bycatch in the Coral Triangle](#)—demonstrates the benefits of using circle hooks
- **Article:** [International Smart Gear Competition](#)—shares information about a real-life engineering competition to create a solution for targeting only intended fish species and reducing bycatch
- **Article:** [Can LED Lights Save Sea Turtles?](#)—describes a game-changing invention by one of the participants in the WWF International Smart Gear Competition
- **Article:** [How a Simple Technology Is Saving Sea Turtles](#)—shows the mechanics behind Turtle Excluder Devices
- **Article:** [The Vaquita: 5 Facts About the Most Endangered Marine Mammal](#)—provides information about the vaquita, including the severity of the threat of bycatch and what can be done to help save this species
- **Article:** [Our oceans are haunted by ghost nets: Why that's scary and what we can do](#)—reveals the frightening truth behind the damaging effects of ghost nets
- **Article:** [Stemming the Tide](#)—tells of how with the help of people, WWF strives to improve the state of our oceans
- **Video:** [A Turtle's Eye View of the Great Barrier Reef](#)—shows scenes from the Great Barrier Reef from the perspective of a sea turtle



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SEA TURTLES

Name: _____ Date: _____

● Be Careful What You Fish For Lab Report Worksheet

Question
(What are you trying to find out?)

Hypothesis
(What do you predict will happen?)

I think _____

because _____

Materials
(List amounts of everything you're using)

-
-
-
-
-
-
-

● Procedure

- 1) With your group, count the total number of each color in your bin, and record these in your materials list.
- 2) Decide who will use what tool. Remember, if performing more than one trial, you will switch tools after each trial. Start with Trial 1, and write down everybody's name and what fishing tool/method they will be modeling in your Data Table Worksheet (first two columns).
- 3) Decide who is going first. In one attempt, use your assigned fishing tool and method to pull up as many of the targeted species and as few of the non-targeted species as possible.
- 4) Count and record the results in your Data Table Worksheet. Then return the pieces to the bin, mix them, and proceed with the next person.
- 5) If performing more than one trial, rotate who uses which tool and repeat steps 2 through 5, recording results in the various trial tables on your worksheet.



SEA TURTLES

● Data Table Worksheet

Trial 1

Group member name	Fishing device/method used	Number of species caught on purpose	Number of species caught by accident	How many of the species caught by accident were sea turtles?

Trial 2

Group member name	Fishing device/method used	Number of species caught on purpose	Number of species caught by accident	How many of the species caught by accident were sea turtles?



SEA TURTLES

Trial 3

Group member name	Fishing device/method used	Number of species caught on purpose	Number of species caught by accident	How many of the species caught by accident were sea turtles?



SEA TURTLES

● Conclusions Worksheet

1) What did you and your group discover by doing this activity?

2) What could be a reason for your group members getting different results than you?

3) Was your hypothesis correct? What fishing method seemed to work best at catching your targeted species and excluding your non-targeted species?

4) What were some difficulties your group encountered while doing this activity?

5) How might the difficulties your group had compare to the real-life difficulties that commercial fishers have?

6) How do the problems with these fishing practices affect sea turtles?

7) Can you think of any solutions to this problem?



SEA TURTLES

Learning Activity:

How Low Can They Go?

Activity Type	Game
Focus Areas	Physical education, science
Time Required	30–45 minutes

Overview

This sea turtle-themed twist on the classic game of limbo will allow students to learn about zones of the ocean and the diving abilities of various marine species, especially the leatherback sea turtle. They will discover the adaptations that animals have developed to thrive in each zone and what can cause animals to travel between zones, diving deeper into the ocean. If technology is available, students can use the [WWF Together app](#) to follow a leatherback sea turtle as he travels through the depths of the ocean.

Objective

At the completion of the activity, students should be able to:

- Describe zones of the ocean, comparing species that exist in each.
- Explain what causes animals such as sea turtles to dive to far depths of the ocean.
- Reflect on the adaptations animals must have in order to survive at varying ocean depths.

Subject and Standards

Shape America National PE Standards—Highly Effective Physical Education

- **Standard 1:** The physically literate individual demonstrates competency in a variety of motor skills and movement patterns.
- **Standard 2:** The physically literate individual applies knowledge of concepts, principles, strategies, and tactics related to movement and performance.
- **Standard 4:** The physically literate individual exhibits responsible personal and social behavior that respects self and others.
- **Standard 5:** The physically literate individual recognizes the value of physical activity for health, enjoyment, challenge, self-expression, and/or social interaction.



Next Generation Science Standards

- **3-LS3-2** : Heredity: Inheritance and Variation of Traits
 - Use evidence to support the explanation that traits can be influenced by the environment.
- **3-LS4-3**: Biological Evolution: Unity and Diversity
 - Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

Materials Needed

- Measuring stick (like a yardstick) or pole (like a broomstick)
- Two volunteers to hold the stick
- Music and music player (optional)
- Pictures of diving marine species (optional)
- Access to smartphone or tablet (optional)

Vocabulary

- **Adaptation**: changes to a plant or animal that make it better equipped to survive under the conditions of its environment
- **Photosynthesis**: the process by which plants make chemical (food) energy from water, carbon dioxide, and light
- **Phytoplankton**: microscopic, floating marine plant life that undergoes photosynthesis



● Activity Procedure

Part 1: Introduction and Preparation

- Begin by reviewing with the students the different zones of the ocean. It may be useful to show or draw a diagram on a display board, so that students can visualize these areas as they are described. Students should recognize that different marine animals live in different zones, depending on which best meets their specific needs and in which they are best adapted to survive (see the Vocabulary section above for the definition of “adaptation”).
- Because the ocean is so vast and extends deep beneath the surface, it is helpful when studying the ocean and its inhabitants to reference the different zones. The ocean is generally divided into three zones, which are classified according to the amount of sunlight that reaches them:
 - **The sunlit zone** is the area from the surface of the water to about 656 feet deep and has the largest amount of sunlight. This allows phytoplankton, algae, and other marine plants to carry out photosynthesis. You will find a majority of marine animals in this zone, because they depend on plants as part of their food source. Sea turtles spend the majority of their time in the sunlit zone. Examples of other species living in this zone include whales, dolphins, and a large variety of marine plants and fish, including tuna, rays, and sharks.
 - **The twilight zone** is the area between 656 and 3,280 feet deep. With minimal light penetrating this far, the organisms that exist here have had to adapt to find food and to avoid becoming food. These adaptations include massive eyes and bodies that are see-through or reflect light. Examples of species living in this zone include swordfish, jellyfish, sea sponges, and crustaceans (like shrimp and lobster).
 - **The midnight zone** is below 3,280 feet deep and is in complete darkness. The water is very cold. There are few sources of food and very little oxygen. The few expeditions that have traveled there have discovered strange deep-sea life with distinct characteristics adapted to survive in these conditions. Giant teeth, gaping mouths, long feelers, and the ability to produce light are all traits you could find in species living down here. In this zone, you will find unique-looking animals such as angler fish, giant squid, and midwater shrimp.



- Now that students have a grasp of the three primary ocean zones and the organisms that exist in each, have them brainstorm what they think happens as you travel further down, and why a marine animal would venture beyond the depth zone where it typically lives. What would cause a sea turtle to dive further down?
 - Students should conclude that as less sunlight is available, not only does it become more difficult to see, but the temperature becomes much colder. Reference the difference in temperature between daytime and nighttime in students' own world to help them draw that connection.
 - You can also discuss why they think it may be difficult for humans to travel to lower ocean depths. Again, relate it to real-life examples. What happens when you dive to the deep end of the swimming pool? Not only do light and temperature decrease as you travel downward underwater, but pressure increases because more water is now above you, which accounts for why your ears sometimes hurt when you're diving deep in the pool.
 - When discussing other reasons marine animals may leave their typical zones, be sure to focus the conversation around what things marine animals need to survive. When a sea turtle is diving deep, for what might it be searching? Or from what might it be trying to escape?
- Have students recollect in what zone sea turtles would typically be found (sunlit). Sea turtles need to reach the surface to breathe; however, they can hold their breath for several hours, which comes in handy when diving and migrating long distances. Leatherback sea turtles are able to dive incredibly deep, to 4,035 feet—almost a mile! This is usually to avoid predators, to find cooler water to control their body temperature (if they get too hot), or to find something to eat.

Part 2: Activity

A game of limbo will help students visualize the different ocean zones and the diving abilities of various marine species. They can compare how low they can go with how low different marine animals can go.

- Have two volunteers hold the measuring stick or pole, one at each end. Playing music to accompany the game can help liven the mood, but is not necessary.
- Have students form a line facing the limbo stick. One at a time, each student will attempt to bend backward and walk under the stick without falling. If students fall, they are eliminated. Begin with an easy round, holding the stick at a height that everyone is easily able to walk under.



SEA TURTLES

- During each round, a different marine species will be declared, suggesting that all who are eliminated during that round represent that animal. The species chosen to represent each height of the stick reflect the depth at which they are able to dive in the ocean. See the chart below for suggestions about which species can be declared during which rounds, and their related diving depths and zones.
- Once each participant has had a turn in the first round, move on to the next round and have the stick holders lower the height approximately 2–3 inches. Continue to lower the stick in this fashion after each round.
- As students are eliminated, remind them which species they represent (corresponding with the height of the stick). It would be helpful to have pictures available to show the students each of the species in case they are not familiar. You can also quiz students throughout the game to state the depth zones as the bar gets lowered.
- The leatherback sea turtle will be the species representing the last round, being the deepest diver of the bunch. This scale will allow students to envision and compare the diving capabilities of these marine species in relation to those of the leatherback sea turtle.

ROUND	HEIGHT OF STICK (approximately)	SPECIES	DIVING DEPTH (IN FEET)	DEPTH ZONE
1	4 feet	Marine iguana	66	Sunlit
2	3 feet 9 inches	Vaquita (a small porpoise)	131	Sunlit
3	3 feet 6 inches	Walrus	300	Sunlit
4	3 feet 3 inches	Blue whale	328	Sunlit
5	3 feet	Sea lion	492	Sunlit
6	2 feet 9 inches	Emperor penguin	1,500	Twilight
7	2 feet 6 inches	Beluga whale	2,624	Twilight
8	2 feet 3 inches	Great white shark	3,543	Midnight
9	2 feet	Bluefin tuna	4,000	Midnight
10	1 feet 9 inches	Leatherback sea turtle	4,035	Midnight



Part 3: Discussion and Assessment

- Recap the game by asking students to consider why they think each species dives to the sunlit, twilight, or midnight depth zones. Many of these animals must reach the surface to breathe, so what would make them travel so deep? And what sort of adaptations would they need in order to do so? What adaptations might happen due to changing temperatures and amount of light in deeper depths?
- Spark further curiosity and discussion by asking students if they believe there are other zones that exist beyond the midnight zone. If so, what kind of conditions would they expect to occur (for example, even colder temperatures) and what kind of life would exist there? How would marine life need to adapt in order to survive?
 - Beyond the midnight zone lies the abyss (seafloor) and trenches. Scientists have only explored 1% of this area, so very little is known about it. However, from the information that has been gathered, there are certain organisms that might be able to withstand such extreme cold-water temperatures, including species of sea stars, sea urchins, fish, and crustaceans.
- If available, use a tablet or smartphone to download the [WWF Together app](#). Encourage students to explore the sea turtle segment, which contains a fun, interactive module about marine animal diving depths that is connected to this activity.

Extended Learning Options

- Start a class fundraiser to protect sea turtles and other wildlife and their habitats, using WWF's online fundraising tool, Panda Nation. Learn more at www.pandanation.org.
- Have students reflect on other examples of adaptations exhibited by species in the wild and/or humans. How have these species made changes in order to thrive in their environments?
- Pair this activity with another from the [Sea Turtle Toolkit](#), such as *Case of the Missing Sea Turtle*, to learn more about how climate change is causing oceans to warm and sea turtles to relocate.





● Additional Background Info

You can use the information found at the links below to enhance your discussion with the class, or you may want to share some links directly with students if you determine they are grade-level appropriate.

- **Article:** [Sea Turtles and Climate Change](#)—discusses evidence of sea turtles having to travel deeper into the oceans in search of cooler waters
- **Article:** [The Vaquita: 5 Facts About the Most Endangered Marine Mammal](#)—provides information about the vaquita, including the severity of the threat of bycatch and what can be done to help save this species
- **Article:** [Stemming the Tide](#)—tells of how with the help of people, WWF strives to improve the state of our oceans
- **Video:** [A Turtle's Eye View of the Great Barrier Reef](#)—shows scenes from the Great Barrier Reef from the perspective of a sea turtle
- **Web Feature:** [WWF Oceans](#)—provides facts and information about ocean habitats and why they're so important
- **Web Feature:** [WWF Featured Species: Sea Turtle](#)—provides facts and information about sea turtles and their ocean habitats, the threats they face, and how you can help save them

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SEA TURTLES

Learning Activity:

Only Jellies in the Belly

Activity Type	Arts and crafts
Focus Areas	Arts education
Time Required	30–45 minutes

● Overview

In this craft activity, students will use their artistic and creative individuality while learning about the devastating effects of ocean trash (like plastic) on sea turtles and our oceans. Students will craft a jellyfish out of plastic materials, which sea turtles often mistake for food. The students' original art creations will increase their recognition of the resemblance between jellyfish and plastic trash, as well as reinforce the importance of disposing of trash properly.

● Objective

At the completion of the activity, students should be able to:

- Explain how plastic and other types of trash end up in the ocean.
- Describe how plastic pollution negatively impacts sea turtles and oceans.
- Provide suggestions for how people can take action to help save sea turtles and promote healthy oceans.

● Subject and Standards

National Core Arts Standards

- **Creating**

- Anchor Standard #1: Generate and conceptualize artistic ideas and work.
- Anchor Standard #2: Organize and develop artistic ideas and work.
- Anchor Standard #3: Refine and complete artistic work.

- **Responding**

- Anchor Standard #7: Perceive and analyze artistic work.
- Anchor Standard #8: Interpret intent and meaning in artistic work.



- **Connecting**

- Anchor Standard #10: Synthesize and relate knowledge and personal experiences to make art.
- Anchor Standard #11: Relate artistic ideas and works with societal, cultural, and historical context to deepen understanding.

● **Materials Needed**

- [Sea Turtle Educator's Resource Guide](#) (for background reading)
- Various types of clean plastic garbage, enough for several items per participant; suggestions include grocery bags, six-pack rings, fruit cups, bottles, bottle caps, cups, and straws
- Scissors
- Glue or tape
- Coloring supplies (markers, paint, food coloring)
- Rubber bands
- Large, clear container filled with water (optional)

● **Vocabulary**

- **Ecosystem:** the living (plants, animals, other organisms) and non-living (air, water, soil) components of an area that interact with each other in an interconnected way
- **Habitat:** a natural environment in which plants and animals live, breed, and get their food, water, and shelter
- **Pollution:** the act of contaminating an environment, especially with man-made waste
- **Sustainable:** of, relating to, or being a method of harvesting or using a natural resource so that the resource is not depleted or permanently damaged; an effective and innovative way to efficiently use natural resources and ensure their continued supply



● Activity Procedure

Part 1: Introduction and Preparation

- Prior to beginning this activity, students should have a foundational understanding of a sea turtle's habitat and the current threats. [You can find this information in the [Sea Turtle Educator's Resource Guide](#), under the "Sea Turtle Q&A" and "The Threats Sea Turtles Face" sections.]
- Since pollution is one of the current threats that sea turtles face, supervise a student-led discussion reviewing what they know about ocean pollution. Remind them that ocean pollution comes in various forms (trash, oil spills, fertilizer, and pesticide runoff from agriculture), all of which can lead to damaging effects on ocean plants, marine animals, and the environments in which they live.
- Focusing on trash pollution specifically, have the students brainstorm how waste (like plastic bags, straws, and bottles) could end up in the ocean. Highlight that the biggest reason so much trash winds up in oceans is due to poorly managed trash removal systems. Without proper disposal methods, trash can end up being blown or washed into the ocean, or could be dumped there intentionally.
- Discuss the effects that plastics and other garbage can have on marine life, especially sea turtles:
 - Sea turtles, birds, and other marine animals can get caught or twisted in items such as old fishing nets and six-pack rings.
 - Sea turtles and other animals might attempt to swallow items like bottle caps, straws, and plastic bags, which could cause them to choke or might wind up trapped in their digestive systems, blocking their body's ability to process food.
 - Sea turtles are particularly affected by plastic bags floating in the ocean because they resemble jellyfish, a primary food source for sea turtles, especially the leatherback.
 - Plastic that has been in the ocean for an extended period will eventually break down into microscopic particles and become a part of the ecosystem, entering food chains and disturbing the health of marine animals.
- Ask students what people should do with their trash to avoid having it wind up in the ocean. For example, when finished using a plastic product, you should always attempt to reuse it, recycle it, or dispose of it properly.



Part 2: Activity

In this activity, students will reuse plastic garbage to design a unique jellyfish craft.

- Designate a table or area of the room as the materials location. Arrange all materials, including clean plastic garbage items, for student use.
- Inform students that they will be using the provided plastic supplies to design and decorate a jellyfish. If students are unfamiliar with the appearance of jellyfish, be sure to share photos prior to starting.
- Remind students that the purpose of this activity is for them to visually understand how a sea turtle could confuse plastic garbage with jellyfish (a favorite food). If possible, prior to the distribution of materials, submerge a plastic bag into a large, clear container filled with water, so that students can see how it appears underwater.
- Allow students to approach the materials table and select their items. Students should be creative with their use of the materials (the number of items permitted per student will depend on the total amount you were able to gather). This self-guided approach will allow the class to reflect on the individual artistic visions implemented by their peers. For guidance, display a few examples of plastic jellyfish that you have created as a model, or provide suggestions for how to create a jellyfish, such as:
 - Fill a plastic bag with pieces of plastic garbage and tie it off with a rubber band; then cut off the handles of the bag and make them into tentacles.
 - Color the outside of a fruit cup and use it as the head of the jellyfish; then use pieces of bags or straws as tentacles.





Part 3: Discussion and Assessment

- Now that students have completed their jellyfish craft, they should be able to notice and discuss the similarities in appearance between jellyfish and plastic materials, recognizing how a sea turtle could easily see plastic as food.
- Recap the lesson by stressing the importance of trash management and of recycling and reusing whenever possible. The plastic materials in this activity were repurposed to make jellyfish crafts. What are other ways people could reuse these materials?
- Have students contribute suggestions about what they could do to help prevent trash from winding up in our oceans.
- Talk about other ways kids can take action to help save sea turtles and protect their ocean habitats (for example, safeguarding nesting beaches, buying sustainable seafood, and not buying souvenirs made from turtle parts). You can find this information in the [Sea Turtle Educator's Resource Guide](#), under the "What Kids Can Do" section.

Extended Learning Options

- Download the [WWF Together app](#) and explore the sea turtle section to learn more about what sea turtles eat and the threats they face.
- Start a class fundraiser to protect sea turtles and other wildlife and their habitats, using WWF's online fundraising tool, Panda Nation. Learn more at www.pandanation.org.





● Additional Background Info

You can use the information found at the links below to enhance your discussion with the class, or you may want to share some links directly with students if you determine they are grade-level appropriate.

- **Web Feature:** [WWF Featured Species: Sea Turtle](#)—provides facts and information about sea turtles and their ocean habitats, the threats they face, and how you can help save them
- **Article:** [How Long Do Sea Turtles Live? And Other Fun Sea Turtle Facts](#)—answers common questions about sea turtles
- **Video:** [Entangled Olive Ridley Turtle Saved and Released](#)—shows how a sea turtle can easily get tangled in a plastic grocery bag
- **Article:** [What do sea turtles eat? Unfortunately, plastic bags.](#)—explains why sea turtles often eat plastic bags and what can happen as a result
- **Article:** [Plastic in the Ocean](#)—breaks down the causes and effects of the plastic crisis and what can be done to stop it
- **Article:** [The problem with plastic in nature and what you can do to help](#)—briefly describes why we all need to take small steps in our everyday lives to reduce plastic waste

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SEA TURTLES

Learning Activity:

Turtles on Vacation

Activity Type	Travel brochure
Focus Areas	Social studies, language arts
Time Required	Two segments (research and design), each requiring 30–45 minutes

● Overview

Students will be assigned to research different areas of the world where sea turtles are found. Using their understanding of ecotourism and their creativity, they will then design a travel brochure for their assigned areas, showcasing sea turtles as the primary attraction. Through this project, students will learn about ecotourism and how considering the needs of both people and animals can result in a healthy, shared environment.

● Objective

At the completion of the activity, students should be able to:

- Identify and describe various geographical locations around the world where sea turtles are found.
- Explain how animals and people can benefit one another through ecotourism.

● Subject and Standards

C3 Framework for Social Studies State Standards

- D2.Geo.2.3-5: Use maps, satellite images, photographs, and other representations to explain relationships between the locations of places and regions and their environmental characteristics.
- D2.Geo.4.3-5: Explain how culture influences the way people modify and adapt to their environments.
- D2.Geo.8.3-5: Explain how human settlements and movements relate to the locations and use of various natural resources.



Common Core State Standards: English Language Arts

- L. 3.3/4.3/5.3: Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- RI. 3.5: Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.
- RI. 3.7: Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).
- RI. 5.7: Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
- W. 3.1/4.1/5.1: Write opinion pieces on topics or texts, supporting a point of view with reasons and information.
- W. 3.2/4.2/5.2: Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- W. 5.7: Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.
- W. 3.8: Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.

● Materials Needed

- [Sea Turtle Educator's Resource Guide](#) (for background reading)
- Internet access or pre-printed webpages with relevant information about areas of the world with sea turtle ecotourism opportunities: the Mesoamerican Reef, Coastal East Africa, the Coral Triangle, the Galapagos Islands, and the Gulf of California (see links on page 5)
- Printed copy of the Research Planner Worksheet (included at the end of this activity)
- Per student: paper, writing utensil, and coloring supplies (colored pencils and markers)



● Vocabulary

- **Ecotourism:** responsible travel to natural areas that conserves the environment and promotes the welfare of local people
- **Habitat:** a natural environment in which plants and animals live, breed, and get their food, water, and shelter
- **Hatchling:** an animal that recently emerged from an egg

● Activity Procedure

Part 1: Introduction and Preparation

- Consider how familiar your students are with tourism. Explain how tourism can have both negative and positive impacts on an area's surrounding communities. For example:
 - Beaches, being one of the most popular destinations for travelers, are continuously being developed, which can destroy animal habitats like sea turtle nesting beaches. However, one benefit to an increase in visitors is that these tourists visit local attractions and spend money on things like food and souvenirs, which helps provide income and employment for the local people who live there.
- One type of tourism is ecotourism (see vocabulary definition above). Introduce students to the term and ask them if they have ever traveled to a place that offers ecotourism opportunities, or if they know whether any ecotourism opportunities exist in your area. A common example of ecotourism is a nature tour through protected areas (like national parks) to view animals in their natural habitat.
- Direct the ecotourism discussion toward sea turtles. Sea turtles can be found all over the world. However, there are a few regions in particular where they are often seen due to sandy beaches that are perfect for nesting and warm tropical waters that are ideal for feeding. These areas include the Mesoamerican Reef, Coastal East Africa, the Coral Triangle, the Galapagos Islands, and the Gulf of California. These locations are also heavily traveled tourist destinations. See links on page 5 for additional information about these areas.



- Discuss the fact that as tourists become more interested in sea turtles, local communities can create employment and income from ecotourism.
 - There are various ways that local communities can benefit from their proximity to sea turtles without harming them, including ocean tours, nesting beach patrols, and monitoring of hatchlings.
 - Unfortunately, some communities are profiting from sea turtles in harmful ways, such as illegally collecting and trading their meat, eggs, and shells. Sea turtle parts are often turned into souvenirs, such as jewelry or hair combs made from their shells, and then sold to tourists to make money. By creating safe, alternative ways to profit from sea turtles, these communities will no longer be dependent on sea turtle products for income, helping stop the turtle trade.

Part 2: Activity

In this two-segment activity, students will help sea turtles by playing the role of travel agents—designing brochures that entice people to visit the areas where sea turtles live and enjoy turtle-friendly activities.

FIRST SEGMENT: RESEARCH

- For this portion of the activity, students will research one of five identified sea turtle regions of the world. They may choose which of the five areas they'd like to research, or you can assign them an area. This activity can be done individually, or students can work in groups.
- Make sure each student has access to either the internet or other resources from which to read and research the geographic areas where sea turtles are found. You can also create printed handouts for students to reference, using information from the webpages provided on the next page.





- Students will research one of the following areas of the world. If internet access is available, use the links provided to go to the WWF information webpage about this area:
 - [Mesoamerican Reef](#) (lies within the Caribbean Sea and touches the coasts of Mexico, Belize, Guatemala, and Honduras)
 - [Coastal East Africa](#) (western Indian Ocean)
 - [Coral Triangle](#) (western Pacific Ocean, including the waters of Indonesia, Malaysia, the Philippines, Papua New Guinea, Timor Leste, and the Solomon Islands)
 - [The Galapagos](#) (600 miles off the coast of Ecuador)
 - [Gulf of California](#) (the area of the Pacific Ocean that separates Baja California from Mexico)
- Distribute copies of the Research Planner Worksheet provided at the end of this activity. Direct the students to complete their graphic organizers as they research information on their assigned areas of the world. Completing this worksheet will help them prepare for designing their brochures.

SECOND SEGMENT: BROCHURE DESIGN

- Distribute a plain sheet of paper to each student. Provide assistance with tri-folding it into a brochure, if needed. Instruct students to use the paper, writing utensil, and coloring supplies to design a brochure.
- Ask students to use the information they found while doing their research (using their completed Research Planner Worksheets) as a guide to design a brochure that would make people want to visit that area of the world. They should include interesting information about the area that would appeal to traveling tourists.
- Remind students that the focus of their brochures should be around how sea turtles are relevant to that area. They should include descriptions of the role sea turtles play in the area's livelihood as well as suggestions for safe sea turtle activities for ecotourism.



Part 3: Discussion and Assessment

- Have the students share their brochures with one another and discuss why their areas are appealing to tourists who are interested in sea turtles.
- Encourage students to draw conclusions about how sea turtles and humans can help each other. Sea turtles can rely on humans for protection, and humans can rely on sea turtles to make money in safe ways that don't harm them.
- Expand comprehension by asking students to think of other examples of how humans can benefit from the animals around them without disrupting or disturbing the livelihood of the animals. Examples include whale watching, zip-lining through the rain forest, or visiting animal sanctuaries.

Extended Learning Options

- Add a third segment to the activity that incorporates a speaking component. Have the groups of students create a short presentation in the format of a commercial, where they pose as travel agents and promote their area as a great place to visit and engage with sea turtles.
- Start a class fundraiser to protect sea turtles and other wildlife and their habitats, using WWF's online fundraising tool, Panda Nation. Learn more at www.pandanation.org.
- Download the [WWF Together app](#) and explore the sea turtle segment. Use these interactive tools to help kids learn more about sea turtles and the threats they face.

Additional Background Info

You can use the information found at the links below to enhance your discussion with the class, or you may want to share some links directly with students if you determine they are grade-level appropriate.

- **Article:** [Sea Turtles Worth More Alive than Dead, Says WWF](#)—assesses the revenue of marine turtle ecotourism
- **Article:** [Turtles No Longer Turn Into Souvenirs in Dominican Republic](#)—celebrates how one country's government has developed a campaign to crack down on illegal sea turtle trade

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SEA TURTLES

Name: _____ Date: _____

● SEA TURTLE ECOTOURISM: Research Planner Worksheet

My ecotourism location is: _____

Where is it?

What types of animals live here?

Why would this be a nice place to visit?

Why is this area important?

How do people use this area?

How can sea turtles help create tourism?



SEA TURTLES

Learning Activity:

A Need for the Seas

Activity Type	Informative writing exercise
Focus Areas	Language arts
Time Required	30-45 minutes

Overview

Through this reading and writing exercise, students will discover ways that all living things around the world rely on oceans. To apply their reading comprehension, students will share ideas about what oceans provide for people, why it's important to keep our oceans healthy, and how that relates to protecting sea turtles. Using this information, students will compose an informative, persuasive letter to a friend or family member about why sea turtles and their ocean habitat are important and how the recipient of the letter can help protect them.

Objective

At the completion of the activity, students should be able to:

- Describe the current threats facing sea turtles and oceans.
- Present, in writing, an informative and explanatory opinion using logical reasoning to show why it's important to protect sea turtles and oceans.
- Discuss ways in which the students and their friends and families can help protect sea turtles and oceans.

Subject and Standards

Common Core Standards: English Language Arts

- RF. 3.3/4.3/5.3: Know and apply grade-level phonics and word analysis skills in decoding words.
- RF. 3.4/4.4/5.4: Read with sufficient accuracy and fluency to support comprehension.
- RI. 3.1: Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
- RI. 3.2: Determine the main idea of a text; recount the key details and explain how they support the main idea.

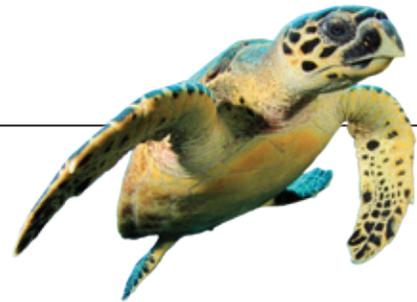


SEA TURTLES

- RI. 3.4/4.4/5.4: Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3/4/5 topic or subject area.
- W. 3.1/4.1/5.1: Write opinion pieces on topics or texts, supporting a point of view with reasons and information.
- W. 3.2/4.2/5.2: Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- W. 3.4/4.4/5.4: Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.
- W. 4.9/5.9: Draw evidence from literary or informational texts to support analysis, reflection, and research.

Materials Needed

- [Sea Turtle Educator's Resource Guide](#) (for background reading)
- Per student: paper and writing utensil



Vocabulary

- **Bycatch:** the accidental capture of species such as dolphins, marine turtles, and seabirds when fishing for or capturing other types of marine species
- **Climate change:** Earth's increase in temperature, attributed directly or indirectly to human activity, that alters the global atmosphere
- **Ecotourism:** responsible travel to natural areas that conserves the environment and promotes the welfare of local people
- **Habitat:** a natural environment in which plants and animals live, breed, and get their food, water, and shelter
- **Habitat loss:** the disappearance of natural environments (required for plants' and animals' survival) due to harvesting for human consumption and/or clearing to make way for agriculture, housing, roads, pipelines, and other forms of industrial development
- **Overharvesting:** excessively gathering, catching, hunting, or killing for human use, sport, or population control
- **Poaching:** hunting or fishing unlawfully



- **Sustainable:** of, relating to, or being a method of harvesting or using a natural resource so that the resource is not depleted or permanently damaged; an effective and innovative way to efficiently use natural resources and ensure their continued supply

● Activity Procedure

Part 1: Introduction and Preparation

- Students should have an understanding of what makes a statement persuasive and opinionated versus explanatory and informative. If they do not, incorporate a brief overview of these principles (see next page) before beginning the activity.
- Distribute a handout you have created using content that is grade-level appropriate from the [Sea Turtle Educator's Resource Guide](#), including the sections on "Why Sea Turtles Matter," "The Threats Sea Turtles Face," and "What Kids Can Do."
- Both sea turtles and humans are dependent on the health of our oceans. As a result, the handout should also include the following points that outline the importance of healthy oceans to lives around the world, including:
 - Oceans generate a large amount of the clean air we breathe.
 - Oceans help shape the world's weather systems and shield us from the effects of climate change by soaking up heat that reaches the planet from the sun.
 - Over 3 billion people rely on fish and other seafood as a major source of food.
 - About 350 million jobs around the globe are linked to the ocean. The marine tourism industry alone provides 200 million jobs worldwide.
 - Ocean waves, winds, and currents offer clean, nonpolluting energy alternatives.
- Students can read this content quietly on their own or with a partner. Team reading is also an option: You can assign each member of the group a section to read aloud within the group.
- Hold a collective discussion reviewing and reflecting on the information in the handout. Use the Vocabulary section included in this activity to define and explain new terminology as it relates to the content. Students should take away from the reading and discussion the connection between protecting sea turtles, the health of the oceans, and why it matters to all of us.



Part 2: Activity

- Now that students have a foundational understanding of why sea turtles and their ocean habitat matter, instruct them to use the handout as a reference and write a letter to a friend or family member. The letter should incorporate both informative and persuasive writing techniques:
 - Informative: explaining why the world needs sea turtles and oceans, and what is threatening them
 - Persuasive: providing reasons why it's important to help protect sea turtles and their ocean habitat, and offering suggestions for what the reader can do to help
- Suggest that students can take their letters home to deliver or mail them to the intended recipient.

Part 3: Discussion and Assessment

- Ask for volunteers to read their letters aloud, and encourage discussion about what makes each letter informative and persuasive.
- Encourage students to suggest how they, individually or as a class, can contribute to the protection of sea turtles and oceans, based on the “What Kids Can Do” content from the [Sea Turtle Educator's Resource Guide](#).

Extended Learning Options

- Start a class fundraiser to protect sea turtles and other wildlife and their habitats, using WWF's online fundraising tool, Panda Nation. Learn more at www.pandanation.org.
- Download the [WWF Together app](#) and explore the sea turtle segment. Use these interactive tools to help kids learn more about sea turtles and the threats they face.





● Additional Background Info

You can use the information found at the links below to enhance your discussion with the class, or you may want to share some links directly with students if you determine they are grade-level appropriate.

- **Article:** [Determined to Save Turtles](#)—shows how a WWF sea turtle monitoring program changed a young man’s way of life
- **Video:** [Sea Turtle Tagging in Colombia](#)—reviews why and how scientists are tracking sea turtles to learn more about them
- **Article:** [Stemming the Tide](#)—tells of how with the help of people, WWF strives to improve the state of our oceans
- **Web Feature:** [WWF Oceans](#)—provides facts and information about ocean habitats and why they’re so important

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